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(54) Coaxial connector body

(57) A coaxial connector body (1) is formed from plate by stamping and rolling. It comprises a coaxial connector part (2) and also a crimp barrel (3) adapted such that a coaxial cable can be crimped thereon. The crimp barrel (3) has a first longitudinal edge (7) with a first tab

(11) and a second longitudinal edge (8) with a second tab (12). The tabs provide an overlap to the abutment between the two edges, therefore providing sufficient structural strength to prevent torsional deformation of the crimp barrel (3) during crimping.

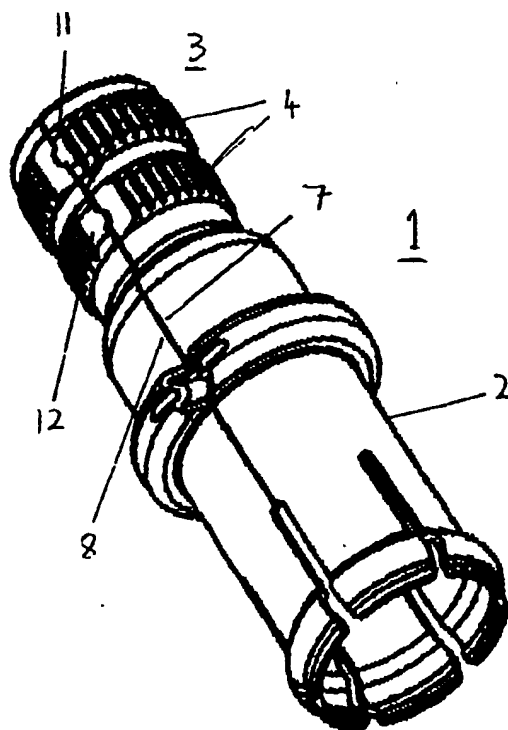


FIG. 1

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Description

The invention relates to a coaxial connector body, and to a method of manufacturing such a body. The invention further relates to a coaxial cable connector.

A coaxial connector body is the main structural element of a coaxial connector. The body is typically manufactured of metallic material and provides the electrical path from the outer conductor of, typically, a coaxial cable: within the connector body is located an insulator, and, isolated from the connector body by the insulator, a suitable connection for the inner conductor of a coaxial cable.

In general, coaxial connectors are attached to coaxial cable by a procedure which involves crimping the coaxial cable onto the coaxial connector body with a ferrule. Coaxial connector bodies adapted for such use therefore have a crimp barrel, on which the outer conductor of a coaxial cable can be crimped. The crimp barrel needs considerable structural strength so that it will not deform under the forces involved in crimping. However, such structural strength is not required in the connector part of the coaxial connector body: by contrast, for a male connector the connector part comprises a plurality of spring fingers, which need to be resilient. Therefore such connector bodies have been typically formed by separate preparation of the connector part and of the crimp barrel, these components then being attached together in an appropriate manner.

The different requirements for the crimp barrel and for the connector part have therefore resulted in a relatively high cost of manufacture for coaxial connector bodies. It would therefore be desirable to reduce the cost of manufacture of a coaxial connector body whilst still meeting the functional requirements imposed by the crimp barrel and the connector part.

Accordingly, the invention provides a coaxial connector body formed from plate by stamping and rolling, comprising:

a coaxial connector part adapted for releasable engagement with another coaxial connector body; and a crimp barrel adapted such that the outer conductor of a coaxial cable can be crimped thereon, wherein the crimp barrel has a first longitudinal edge and a second longitudinal edge which abut each other and wherein overlap means are provided at this abutment to prevent torsional deformation of the crimp barrel during crimping.

In preferred embodiments, the diameter of the crimp barrel is less than that of the connector part. Advantageously, the overlap means comprises a first tab extending from the first edge to overlap the second edge, and a second tab extending from the second edge to overlap the first edge. Preferably, the tabs provide at least 0.25 mm of overlap, to provide sufficient resistance against torsional deformation of the crimp barrel during

crimping. Advantageously, the barrel comprises two knurled annular sections, advantageously of greater diameter than other parts of the crimp barrel, wherein the first tab extends from one of the knurled annular sections and the second tab extends from the other of the knurled annular sections. A particularly suitable material for the coaxial connector body is phosphor bronze.

The invention extends to a coaxial connector comprising a coaxial connector body as indicated above. Other elements of the coaxial connector will be as in conventional coaxial connectors.

The invention further provides a method of forming a coaxial connector body as indicated above by stamping a coaxial connector body blank from a flat metal sheet and by rolling the coaxial connector body blank to form a coaxial connector body.

Accordingly, the functional requirements of both the crimp barrel and the connector part can be met. In particular, although the male connector part is provided with resilient spring fingers, the crimp barrel is nonetheless provided through the overlap means with sufficient structural strength that torsional deformation will not occur during crimping. The method of formation of the coaxial connector body itself demands a significant degree of malleability from the material used. If the plate of material used to form the body is not sufficiently malleable, the operation of stamping and rolling the coaxial connector body, in particular with respect to the small diameter crimp barrel, will be difficult to achieve reliably. It is therefore necessary to use a relatively thin sheet of malleable material even when forming a female connector, which has no particular requirement for resilience as the connector part consists of a cylindrical wall. In this case also, the nature of the material needed to form the connector body by such a process requires the use of overlap means to give the crimp barrel sufficient structural strength.

Specific embodiments of the invention are described below, by way of example, with reference to the accompanying drawings, in which:

Figure 1 shows a coaxial connector body according to an embodiment of the invention;

Figure 2 shows the crimp barrel of the coaxial connector body of Figure 1, partially in cross section; and

Figure 3 shows a cross section through line BB of Figure 2.

Figure 1 shows a coaxial connector body which can be formed from plate by stamping and rolling. The body has a coaxial connector part 2 adapted for releasable engagement with another coaxial connector body. The coaxial connector part shown here is for a male connector, as the connector part 2 comprises a plurality of spring fingers. Alternatively, the coaxial connector body could be for a female connector, in which case the connector part would comprise a cylindrical barrel into

which a plurality of spring fingers of a male connector be inserted to bear against the internal wall thereof.

The connector body 1 also comprises a crimp barrel 3. The crimp barrel 3 is adapted such that the outer conductor of a coaxial cable (not shown) can be crimped thereon. As it is formed by rolling, the crimp barrel has two longitudinal edges which abut each other in the connector body: a first longitudinal edge 7 and a second longitudinal edge 8.

In order to provide the structural strength in the crimp barrel needed to prevent torsional deformation during crimping, overlap means are provided. In the embodiment shown in Figure 1, the overlap means comprise a first tab 11 and a second tab 12. The tabs 11, 12 each extend from one of the longitudinal edges 7, 8: the first tab 11 extends from the first longitudinal edge 7 and the second tab 12 extends from the second longitudinal edge 8. Each tab overlaps, to the outside of the connector body, the opposed edge of the crimp barrel. The structural strength is provided as one tab prevents buckling such that the first edge slips under the second edge, and the other tab prevents buckling such that the second edge slips under the first edge. The tabs 11, 12 need to be of sufficient dimension that buckling of the crimp barrel during crimping will not occur. In a preferred embodiment, the connector body is formed from plate 0.3 mm thick, and made of phosphor bronze. In this case, an overlap of 0.25 mm is substantially the minimum amount to provide the needed structural strength. The overlap is here provided for each tab along a longitudinal distance of substantially 0.6 mm. This overlap can be seen clearly in Figure 3.

As can be seen from Figure 2, the tabs are here located on two knurled annular sections 4 of the crimp barrel 3. The sections are knurled except at the edge which is to be overlapped by a tab: here, there is no knurling, but rather a flat sloped part to allow easy and reliable overlap by the tab. The knurled sections 4 are of greater diameter than the remainder of the crimp barrel 3 to provide a satisfactory engagement with the crimped cable. However, the crimp barrel 3 is itself of lesser diameter than the connector part 2.

Manufacture of such connector bodies from other copper based materials other than phosphor bronze is also possible, but the properties of phosphor bronze are such as to render it particularly suitable for this purpose. The dimensions of the overlap means, as the skilled man will appreciate, can be changed provided that the object of preventing deformation of the crimp barrel during crimping is achieved.

The coaxial connector body can therefore be formed by particularly desirable conventional processes for manufacture of metallic parts which have not previously been appropriate for manufacture of coaxial connector bodies. In particular, the coaxial connector body can be formed by stamping of a blank from a flat metal sheet, and then by rolling of the blank to form a coaxial connector body 1 as shown in Figure 1.

Claims

1. Coaxial connector body formed from plate by stamping and rolling, comprising:
 - a coaxial connector part adapted for releasable engagement with another coaxial connector body; and
 - a crimp barrel adapted such that the outer conductor of a coaxial cable can be crimped thereon, wherein the crimp barrel has a first longitudinal edge and a second longitudinal edge which abut each other, and wherein overlap means are provided at this abutment to prevent torsional deformation of the crimp barrel during crimping.
2. Coaxial connector body as claimed in claim 1, wherein the diameter of the crimp barrel is less than that of the coaxial connector part.
3. Coaxial connector body as claimed in claim 2, wherein the overlap means comprises a first tab extending from the first edge to overlap the second edge, and a second tab extending from the second edge to overlap the first edge.
4. Coaxial connector body as claimed in claim 3, wherein said tabs provide at least 0.25 mm of overlap.
5. Coaxial connector body as claimed in claim 3 or claim 4, wherein the crimp barrel comprises two knurled annular sections, and wherein said first tab extends from one of said knurled annular sections and said second tab extends from the other one of said knurled annular sections.
6. Coaxial connector body as claimed in claim 5, wherein the knurled annular sections of the crimp barrel have a greater diameter than other parts of the crimp barrel.
7. Coaxial connector body as claimed in any preceding claim, wherein said connector body is formed from plate of substantially 0.3 mm thickness.
8. Coaxial connector body as claimed in any preceding claim and formed of a material comprising copper.
9. Coaxial connector body as claimed in claim 8 and formed of phosphor bronze.
10. Coaxial connector body as claimed in any preceding claim, wherein the coaxial connector part comprises a plurality of spring fingers.

11. Coaxial connector body as claimed in any of claims 1 to 9, wherein the coaxial connector part comprises a cylindrical barrel.
12. Coaxial connector body substantially as described herein with reference to Figures 1 to 3 of the accompanying drawings. 5
13. Coaxial connector comprising a coaxial cable connector body as claimed in any preceding claim. 10
14. A method of forming a coaxial connector body as claimed in any of claims 1 to 12, comprising:
- stamping a coaxial connector body blank from a flat metal sheet; and 15
- rolling the coaxial connector body blank to form a coaxial cable connector body. 20

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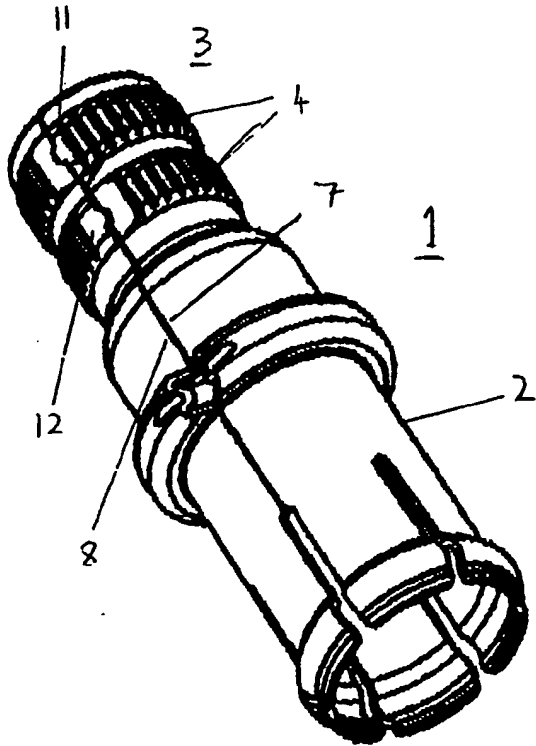


FIG. 1

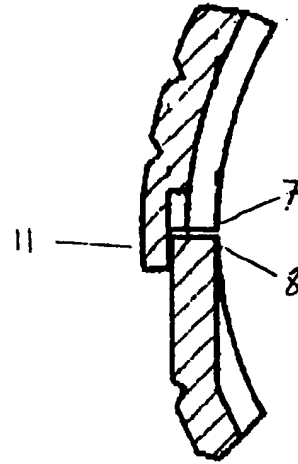


FIG. 3

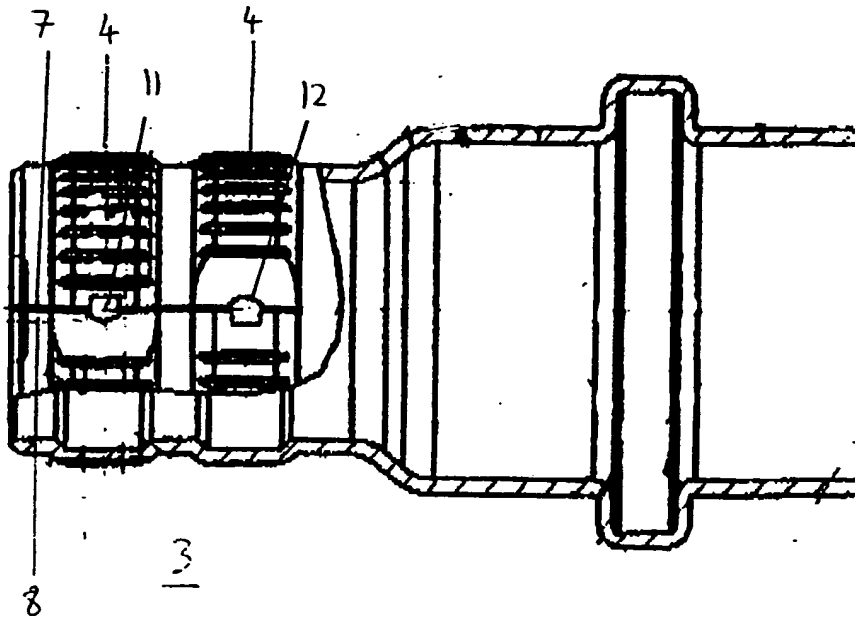


FIG. 2

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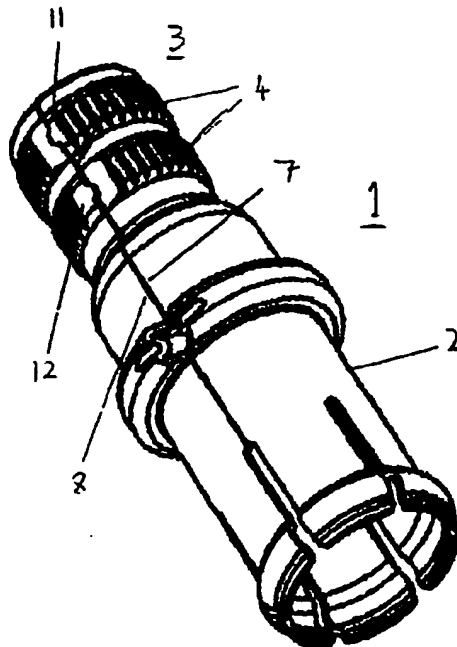


FIG. 1

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EUROPEAN SEARCH REPORT

Application Number
EP 97 30 7280

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	GB 1 211 486 A (AMP INC) 4 November 1970 * page 1, line 67 - page 2, line 47; claims 1,2,4; figures 1-4 *	1,10,11, 13,14	H01R9/05
X	US 4 070 751 A (HOGENDOBLE RICHARD SHURE ET AL) 31 January 1978 * column 1, line 18-63 * * column 2, line 43 - column 3, line 16 * * column 3, line 48 - column 5, line 2; figures 1-5 *	1,2,11, 13,14	
X	US 3 923 367 A (CARTER DAVID P) 2 December 1975 * abstract; figures 1-3 *	14	
A		1,13	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			H01R
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 11 August 1998	Examiner Schaap, E
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